

What is claimed is:

1. Apparatus for placing pipe piling in the ground, comprising:

pipe piling having an upper end portion and a lower end portion;

a support frame;

a motor mounted on said support frame, said motor having a downwardly extending

5 rotary output shaft;

a drive head mounted on said support frame for rotation about a vertical axis;

said output shaft being connected to said drive head such that rotation of said output shaft by said motor will rotate the drive head about said vertical axis;

said drive head being drivenly connectable to the upper end portion of the pipe piling;

10 clamping apparatus mounted on side portions of the support frame, below said drive head, said clamping apparatus including:

a pair of horizontally disposed linear hydraulic actuators, each said actuator comprising a fixed outer end portion and a retractable/extendible/rotatable inner end portion; and

15 a pair of pipe piling engaging clamps connected to the inner end portions of the actuators, said clamps confronting each other across a space between them, said clamps being adapted to receive between them a section of pipe piling when the upper end portion of the pipe piling is drivenly connected to said drive head;

20 whereby the actuators can be retracted to move the clamps apart and provide between them said pipe piling receiving space, and the actuators can be extended to move the clamps towards each other and into clamping engagement with a pipe piling that has been placed in said space between the clamps.

2. The apparatus of claim 1, wherein said upper end portion of said pipe piling includes a ring surrounding the pipe piling, wherein wrench flats are provided on said ring, and wherein said drive head includes a socket for engaging the upper end portion of said pipe piling and a socket wrench in said socket for engaging said wrench flats, to drivenly connect the drive head to the upper end portion of the pipe piling.

3. The apparatus of claim 2, wherein the ring includes at least four wrench flats equally spaced about the circumference of the ring.

4. The apparatus of claim 2, wherein the ring includes eight wrench flats equally spaced about the circumference of the ring.

5. The apparatus of claim 2, wherein the socket and socket wrench are formed in a first tubular member and the drive head includes a second tubular member surrounding the first tubular member in which the first tubular member is housed.

6. The apparatus of claim 5, wherein the second tubular member has a radially inwardly projecting lower end flange and said inner tubular member has a lower edge that axially confronts the inwardly projecting lower end flange, and wherein said first tubular member is axially movable up and down in said second tubular member relative to the lower end flange.

7. The apparatus of claim 6, wherein the first tubular member is movable axially and is rotatable relative to the second tubular member.

8. The apparatus of claim 7, wherein the output shaft of the motor has a non-circular cross section and the first tubular member includes a socket at its upper end that is sized and shaped to snugly receive the output shaft of the motor.

9. The apparatus of claim 1, wherein the support frame includes a connection for connecting it to an overhead structure and the apparatus includes the overhead structure, and wherein the support frame, the motor, the drive head and the clamping apparatus are all supported by the overhead structure.

10. The apparatus of claim 9, wherein the connection for connecting the support frame to the overhead structure includes a universal joint.

11. The apparatus of claim 1, wherein the support frame includes a horizontal beam section having a center portion and side portions flanking the center portion, said motor is mounted on the center portion of the beam section, said linear hydraulic actuators depend from the end portions of the beam section, and said apparatus includes an arch composed of

- 5 arch side members connected at the lower ends to the side portions of the beam section and having a top member interconnecting upper ends of the side portions of the arch above the motor, and wherein the connection for connecting the support frame to an overhead structure is mounted on the top portion of the arch.

12. The apparatus of claim 1, wherein the lower end portion of said pipe piling includes an augur for engaging the ground and screwing the pipe piling downwardly into the ground in response to rotation of the pipe piling by the drive head.

13. The apparatus of claim 12, including a ring surrounding the upper end portion of the pipe piling and wrench flats on said ring, and wherein said drive head includes, a socket wrench for engaging said wrench flats to drivenly connect the drive head to the pipe piling.

14. The apparatus of claim 12, wherein the pipe piling is composed of a plurality of sections that are connected together, wherein each upper section has a lower end that includes a threaded pin and each lower section includes an upper end that includes a threaded box for engaging the threaded pin of the section above it.

15. The apparatus of claim 14, wherein the pipe piling includes a bottom section on which the said augur is formed.

16. The apparatus of claim 1 wherein the upper end of the pipe piling includes a threaded box, wherein a threaded plug is screwed into said box and the threaded plug is connected to the output shaft of the drive motor.

17. The apparatus of claim 16 wherein the output shaft of the motor has a non-circular cross section and the threaded plug includes a socket at its upper end that is sized and shaped to snugly receive the output shaft of the motor.

18. Apparatus for placing pipe piling in the ground, comprising:

pipe piling having a an upper end portion including a threaded box and exterior wrench flats;

a support frame having a center portion and side portions flanking the center portion;

5 a motor mounted on the center portion of said support frame, said motor having a downwardly extending rotary output shaft;

a drive head mounted on the central portion of said support frame for rotation about a vertical axis;

10 said output shaft being connected to said drive head such that rotation of said output shaft by said motor will rotate the drive head about said vertical axis;

said drive head including a downwardly opening socket for receiving the upper end portion of the pipe piling;

a wrench section in said socket for engaging the wrench flats on the pipe piling when the upper end portion of the pipe piling is in the socket;

15 clamping apparatus on the side portions of the support frame below said drive head, said clamping apparatus including:

a pair of horizontally disposed linear hydraulic actuators, each said actuator comprising a fixed outer end portion and a retractable/extendible/rotatable inner end portion; and

20 a pair of pipe piling engaging clamps connected to the inner end portions of the actuators, said clamps confronting each other across a space between them, said clamps being adapted to receive between them a section of pipe piling that is below the wrench flats on the pipe piling when the upper end portion of the pipe piling is in the socket;

25 whereby the actuators can be retracted to move the clamps apart and provide between them said pipe piling receiving space, and the actuators can be extended to move the clamps towards each other and into clamping engagement with a pipe piling that has been placed in said space between the clamps.

19. The apparatus of claim 18, including a ring surrounding the pipe piling and wrench flats on said ring.

20. The apparatus of claim 19, wherein the ring includes at least four wrench flats equally spaced about the circumference of the ring.

21. The apparatus of claim 19, wherein the ring includes eight wrench flats equally spaced about the circumference of the ring.

22. The apparatus of claim 18, wherein the drive head includes a first tubular member, wherein the drive head includes a second tubular member surrounding the first tubular member in which the first tubular member is housed, and wherein the first tubular member includes the wrench section.

23. The apparatus of claim 22, wherein the second tubular member has a radially inwardly projecting lower end flange and said inner tubular member has a lower edge that axially confronts the inwardly projecting lower end flange, and wherein said first tubular member is axially movable up and down in said second tubular member relative to the lower end flange.

24. The apparatus of claim 23, wherein the first tubular member is movable axially and is rotateable relative to the second tubular member.

25. The apparatus of claim 24, wherein the output shaft of the motor has a non-circular cross section and the first tubular member includes a socket at its upper end that is sized and shaped to snugly receive the output shaft of the motor.

26. The apparatus of claim 18, wherein the support frame includes a connection for connecting it to an overhead structure and the apparatus includes the overhead structure, and the support frame, the motor, the drive head and the clamping apparatus are all supported by the overhead structure.

27. The apparatus of claim 26, wherein the connection for connecting the support frame to the overhead structure includes a universal joint.

28. The apparatus of claim 18, wherein the support frame includes a horizontal beam section having a center portion and side portions flanking the center portion, said motor is mounted on the center portion of the beam section, said linear hydraulic actuators depend

from the end portions of the beam section, and said apparatus includes an arch composed of arch side members connected at the lower ends to the side portions of the beam section and having a top member interconnecting upper ends of the side portions of the arch above the motor, and wherein the connection for connecting the support frame to an overhead structure
5 is mounted on the top portion of the arch.

29. The apparatus of claim 26, wherein the pipe piling includes a ring and the wrench flats are on said ring.

30. The apparatus of claim 29, wherein the ring includes at least four wrench flats equally spaced about the circumference of the ring.

31. The apparatus of claim 29, wherein the ring includes eight wrench flats equally spaced about the circumference of the ring.

32. The apparatus of claim 18, wherein the pipe piling has a lower end that includes an augur for engaging the ground and screwing the pipe piling downwardly into the ground in response to rotation of the pipe piling by the drive head.

33. The apparatus of claim 32, wherein the pipe piling includes a ring and the wrench flats are provided on said ring.